

author, wrote, towards the end of the sixteenth century, a treatise, "About Greenland." In a second edition (about 1600) he added some extracts from the "Kings-mirror,"¹ and among these, one about the Aurora Borealis. But here he has inserted a remark, which in a high degree has attracted attention and caused astonishment, and which, till now, has been inexplicable to the investigators of the Aurora Borealis. I give further on a translation of the description of the Aurora Borealis in the "Kings-mirror," and after it the version of Peder Claussön :—

Kings-mirror

"Such a nature and condition has the north-light, that the more obscure the night, the more brilliant it appears, and only in the night is it to be seen, never during the daytime, and especially in profound darkness, but seldom by moonlight. It appears as a large flame from a heavy fire seen from afar. Out of this flame protrudes, apparently up in the air, sharp points of unequal height, and very unsteady, so that now one, then the other is higher, and in such a manner this light is pendent like a luminous blaze. As long as these flashes are most intense and bright, such a keen light radiates from these streams of fire and rays, that outdoor people can find their way, and even go a hunting, if it should be necessary. Also, when people are in houses provided with windows, it is so bright inside that all present can recognise each other. But this light is so fluctuating that it sometimes seems to darken, as if a black smoke or a heavy nebulous cloud had been puffed into it, and then shortly again it seems as if the light were about to be smothered in this smoke, and almost become quite extinct. But as soon as this fog commences to dissolve, then this light brightens, and clears up for the second time, and it happens even that one would believe that heavy sparks emitted from it as from a red-hot iron just taken out of the forge. When the night declines, and with day-break this light begins to decrease, and when the day has set in it seems entirely to disappear."

Peder Claussön Friis

"In Greenland a meteor and bright light is seen on the sky during the night, which appears in the following manner: the more obscure the night the more brilliant is the light; that is to say, the less the moon shines, and when she is in her prime or wane, the more this light becomes visible in the sky, however, always towards the north, AND NEVER SO HIGH IN THE SKY AS TO BE OBSERVED IN OTHER COUNTRIES THAN GREENLAND, ICELAND, AND THE NORTHERN PART OF NORWAY, and for that reason it is called North-light.

"It appears as a flame or a darting fire, and extends over the sky like a tall and slender hedge, and it rushes up and down in a trice as if many organ pipes were posted one beside the other, and in the twinkling of an eye one shoots up and the other down, and where the flame darts clearest up and down, back and forwards, it can grow dim and almost leave behind it a smoke; but the next moment light up again on another spot, or catch fire where it just before seemed to be extinguished. Nobody who has not himself seen it, can imagine how quickly this light moves forwards and backwards, as if it were hopping and dancing with much agitation. And when this light is most intense, people can perceive everything in the houses as if the moon were shining. At daybreak this northlight fades away."

The "Kings-mirror" was written about 1250, at all events before 1260, and probably later than 1240. The home of the unknown, but at all events Norwegian, author may be looked for, according to the sagacious reasoning of H. Geelmuyden (Christiania Observatory) between 64° 23' and 64° 58' N. lat. (not far from the town of Namsos). This description of the aurora is indeed unparalleled in the aurora literature of the past ages; the noble but unvarnished manner in which he describes the phenomenon has not a counterpart in the same or at a much later period. It is peculiar, however, that the aurora is mentioned in the "Kings-mirror" as a phenomenon chiefly characteristic of Greenland, and not even an intimation is given as to its being visible in Norway. This description indicates, nevertheless, quite plainly that it is based on the author's own observation of the aurora in his native country, and it is there-

fore beyond doubt that he was familiar with the phenomenon,¹ although he has considered Greenland—the country situated, according to the opinion of past ages, farthest towards the north—the proper home of the aurora.

In Peder Claussön's above quoted version of the aurora description in the "Kings-mirror" I have made the remarks and expressions differing from the "Kings-mirror" conspicuous by italics. It will be seen that his citation is rather free; many of these conspicuous expressions, if not all, point to Peder Claussön's knowledge of the aurora through his own observation. The more striking is the conspicuous remark that the aurora in Greenland does not appear so high in the sky as to be observed in other countries than Greenland, Iceland, and the northern part of Norway.

This remark has been inserted in many other publications, and all historians of the aurora from Mairan to Fritz have occupied themselves with the notable circumstance that, according to this remark, the aurora was not visible during the last half of the sixteenth century in Southern Norway. But nowhere in the whole history of the aurora is it so evident how much caution must be displayed in drawing comprehensive inferences from a single remark of an old author.

Peder Claussön has, in a single copy of his treatise on Greenland in the year 1604 or 1605, with regard to the aurora, added the following important "note," hitherto unknown to the investigators of the aurora :—

"This northlight was, as before said, only seen in past times in northern countries. But in the period of my infancy, about the year 1550, it was first seen by people who live in the southern part of Norway, however not higher on the sky than the Polar Star. But since the year 1570 it ascends to such a height that it appears to us in the south-east and in a southern direction, and I suppose that it is seen at present also in other countries."

Peder Claussön's relation is thus in downright contradiction with the interpretation given to his above-mentioned remark. It remains now to explain how he could write, in the year 1600, that the aurora was only visible in the extreme north of Norway. It may be seen that he had the opinion that the aurora, in "past times," was only visible in "the northern countries"; the silence of the "Kings-mirror" about this phenomenon in Norway has perhaps brought him to this conclusion. The remark "and never so high in the sky as to be observed," &c., therefore, in all probability describes the circumstances which, after his opinion, took place at the time when the "Kings-mirror" was written. The additional clause, "and for that reason it is called northlight," seems at the same time to intimate that he, by the previous remark, would explain why the author of the "Kings-mirror" uses the expression northlight (namely, because it is visible only in the extreme northern countries).

SOPHUS TROMHOLT

Christiania

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

CAMBRIDGE.—Two studentships have been established at St. John's College on the foundation of the Rev. Mr. Hutchinson, late Senior Fellow. They are of the value of 60*l.* a year for two years and are tenable with a Foundation Scholarship. Any student of the College who shall be *bond fide* engaged in the pursuit of some branch or branches of physical or natural science or in the study of Semitic or Indian languages, and shall be of not less than nine and not more than eighteen terms' standing from the commencement of his residence in the University shall be qualified to be a candidate, and if there is no candidate belonging to the College of sufficient merit in these studies, the Council may elect a student engaged in any study, whether a member of the College or not. The Council may impose such conditions on the students as shall encourage genuine study after the best methods—*e.g.* they may require him to present in writing an account of his studies, to deliver lectures, &c. The election will take place in June each year.

It will be seen that a Hutchinson student may be free to work at biology in Naples, to join an Eclipse Expedition, to study Pali in Ceylon or Hebrew in Cambridge. We hope to hear of the Hutchinson students in the future.

The Senate has approved of the erection of a new Chemical

¹ The author himself never visited Greenland.

¹ The Kings-mirror (Konungs skuggsjá) is, of its kind, an unparalleled Norwegian work, in which an ingenious and noble man, who must have stood at the height of culture at his time, has expounded his philosophy and especially his views on State administration and ethics, in the form of conversations between a father and son. It is a book on good manners, social intercourse of the highest interest, because of the whole form of culture which it represents, and is written in elevated tone.

Laboratory according to Mr. Stevenson's design, and tenders are to be obtained as early as possible.

Mr. J. W. L. Glaisher, F.R.S., is to be Additional Examiner in Part III. of the Mathematical Tripos in January, 1886.

Prof. Bonney and Mr. J. J. H. Teall are appointed Examiners for the Sedgwick Prize to be adjudged next year.

Prof. Macalister will take a class in Osteology during the Long Vacation. There will also be an Introductory Practical Course in Anatomy, illustrated by that of the Dog, superintended by the Professor and Mr. Rolleston. The Demonstrator will take a practical class in Histology during the Long Vacation.

SCIENTIFIC SERIALS

Journal of Anatomy and Physiology, vol. xix., Part 3, April 1, contains:—On the development of the blood-corpuscles in the embryo of *Perca fluviatilis*, by K. F. Wenckebach (plate 11).—Movements of the ulna in rotation of the fore arm, by Dr. J. Heiberg.—The nature of ligaments, part iii., by J. B. Sutton (plate 12).—Supernumerary cervico-dorsal vertebra-bearing ribs, with vertebral and costal asymmetry; abnormal articulation in a sternum, by W. A. Lane.—Some points in the histology of the medulla oblongata, pons varolii, and cerebellum, by Dr. W. A. Hollis (plate 13).—The external auditory meatus in the child; the relations of the larynx and trachea to the vertebral column in the foetus and child; a rare abnormality of the pancreas, by Dr. J. Symington (plate 14).—The existence of a fourth species of the genus *Balanoptera*, by Dr. G. A. Guldberg.—Some variations in the anatomy of the human liver.—Notes on some unusual variations in human anatomy, by Dr. A. Thomson.—Observations in reference to bilateral asymmetry of form and function, by Dr. F. Tuckerman.—Case of exostosis of the ulna, by Dr. R. J. Anderson.—The mu culus sternalis and its occurrence in (human) Anencephalous monsters, by Dr. F. J. Shepherd (plate 15).—The venous system of the bladder and its surroundings, by E. H. Fenwick (plate 16).

The Journal of Physiology, vol. v., Nos. 4, 5, 6, contains:—Observations of the gastric glands of the pig, by M. Greenwood.—Hæmatin compounds, by V. D. Harris.—Papain digestion, by S. H. C. Martin.—The secretion of oxalic acid in the dog under a varying diet, by T. W. Mills.—On the comparison of the concentrations of solutions of different strength of the same absorbing substance, by S. Lea.—On the mutual antagonism between lime and potash salts in toxic doses, by S. Ringer.—The behaviour of the red blood corpuscles, when shaken with indifferent substances, by S. J. Meltzer and W. H. Welch.—On the cardiac rhythm of Invertebrata, by W. B. Ransom.—Some experiments on the liver ferment, by Florence Eves.—An experimental investigation showing that Veratria is similar to lime salts in many respects as regards their action on the ventricle; also showing that veratria and lime salts are reciprocally antagonistic, by S. Ringer.—Some observations on the influence of the vagus and accelerators on the heart of the turtle, by T. W. Mills.—On the anatomy of the cardiac nerves in certain cold-blooded vertebrates, by W. H. Gaskell and Hans Gadow.

Vol. vi., Nos. 1 and 2.—Is the nervous impulse delayed in the motor nerve terminations? by A. W. Hoisholt.—Observations on some of the colouring matters of bile and urine, with special reference to their origin; and on an easy method of procuring hæmatin from blood, by C. A. MacMunn.—The edible bird's nest, or nest of the Java swift (*Collocalia nidifica*), by J. R. Green.—The velocity of accommodation, by J. W. Barrett.—On the physiology of the salivary secretion; part 3, the paralytic secretion of saliva, by J. N. Langley.

Gegenbaur's Morphologisches Jahrbuch, Bd. x., Heft 4, contains: On the morphology of nails, by C. Gegenbaur.—On direct nuclear division in the embryonal membranes in the scorpion, by F. Blochmann (plate 22).—On the derivation of the neural system in the nematodes, by O. Butschli (plate 23).—Studies on the developmental history of the coeloms and Coelom-epithelial in the amphibia, by B. Solger (plates 24 and 25).—Some remarks on the true relations of organisation in the so-called ciliophagellates, and in the noctiluca, by O. Butschli; with a note by E. Askenasy (plates 26 to 28).—The foramen magendii, and the opening in the recessus laterales of the fourth ventricle, by C. Hess (plate 29).—Reply to Dr. Baur, by Dr. W. Dames.—On the beaks of birds and dinosaurs, by Dr. G. Baur.

Zeitschrift für Wissenschaftliche Zoologie, Band xli., Heft 3, contains:—On the history of the formation and on the morpho-

logical value of the ova of *Nepa cinerea* and *Notonecta glauca*, by W. Will (plates 20-22).—On the powers of transformation in the Mexican Axolotl, by Marie von Chauvin.—Contribution to a knowledge of the Trematodes, *Distomum palliatum*, nov. spec., and *D. reticulatum*, nov. spec., by A. Looss (plate 23).—The formation of the radula in the *Cephalophorus* Mollusca, by R. Rossler (plates 24 and 25).—Studies of the fauna of the larger and smaller ponds in the Riesengebirge, by O. Zacharias (plate 26).—On some common developmental processes in Vertebrates, by J. Kollman.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, April 23.—“The Essential Nature of the Colouring of Phytophagous Larvæ (and their pupæ); with an account of some Experiments upon the Relation between the Colour of such Larvæ and that of their Food-plants,” by Edward B. Poulton, M.A., of Jesus and Keble Colleges, Oxford.

Abstract.

The Essential Nature of the Colouring of Phytophagous Larvæ.—Phytophagous larvæ are coloured by pigments derived from the food-plant, pigments proper to the larvæ, and tissues such as fat, which lend incidental aid to the colouring. The altered plant-pigments hitherto detected in larvæ are chlorophyll and xanthophyll, causing the colours green and yellow. The former is termed metachlorophyll, because of the difference between its spectrum and that of unaltered chlorophyll (in the leaf), and because of the chemical differences between its solution in larval blood, &c., and any known solution of plant chlorophyll. The evidence is at present insufficient to warrant the use of a separate name for the derived larval xanthophyll. Other colours hitherto examined are due to true pigments or tissues.

The following table indicates the situations occupied by the different causes of colour, and gives to some extent the historic order of their employment.

I. The internal tissues and organs with ready-made colour	a. Digestive tract.
	b. Fat.
	c. Dorsal vessel.
II. The passage of derived pigments through the walls of the digestive tract into	a. The blood.
	b. The subcuticular tissues.
III. The appearance of true pigment in	a. The hypodermis.
	b. The cuticle.

These causes explain larval and pupal colour, except such instances as the metallic tints of certain pupæ. The different stages of coloration mentioned in the table were not often mutually exclusive, but each new method was an additional resource. The derived pigments more often confer general resemblances, the true pigments special resemblances. In many cases the green colour is due to metachlorophyll in the blood only (many Noctuæ), while in other cases it is also placed in the subcuticular tissues (Sphingidæ). The former larvæ lose their colour locally on slight compression, while the swollen uncompressed part becomes of a deeper tint. When larvæ are dimorphic—green and brown—the colours of the former are mainly due to metachlorophyll, of the latter to true pigments. Such important differences in the causes of colour commonly occur among larvæ from the same batch of eggs, or in the life-history of a green larva, which becomes brown, or *vice versa*. The blood of brown larvæ, with transparent skins, is colourless except in very thick layers; in the brown *Charocampa elenor*, the blood becomes brown, but the bands of metachlorophyll and xanthophyll can be faintly seen. Hence these pigments are not destroyed beyond the point at which they cease to interfere with the changed colour. The derived pigments may exist unchanged in the blood after the larva has altered in colour, if the superficial pigments are completely opaque (many geometers). This persistence of the derived pigments may be very important to the organism. Thus the larva of *Ennomos anularia* is an opaque brown geometer, but pupates in a cocoon of loosely-attached leaves through which it can be seen. Before pupation the true pigment disappears, and the larva and pupa are coloured by metachlorophyll. Again, in many instances the derived pigments are retained in the blood of the pupa and segregated in the ova, when these are yellow or green, serving to tinge the newly-hatched larva before the effects of its first meal can become apparent. But after such a long period, and the alternation of solution in blood and deposition in tissue, the